

STUDIES IN AQUATIC INSECTS, XVIII: NEW SPECIES AND NEW RECORD OF CADDISFLIES (TRICHOPTERA) FROM MEXICO¹

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ABSTRACT: Seven new species of caddisflies collected in Mexico are described and the male genitalia are figured. The species *Leucotrichia extraordinaria* n. sp. and *Byrsopteryx tabasquensis* n. sp. belong to the family Hydroptilidae, *Chimarra chimalapa* n. sp. to the family Philopotamidae, *Smicridea pochutla* n. sp. and *Leptonema pinotepa* n. sp. to Hydropsychidae, and *Lepidostoma ixtlahuaca* n. sp. and *Lepidostoma pinotepa* n. sp. to Lepidostomatidae. The genus *Byrsopteryx* is recorded from Mexico for the first time.

During the past years, we have been collecting specimens in different areas of Mexico. As a result, we now know that more collecting in the numerous streams of the tropical rain forest of Mexico will be necessary in this region since a great diversity of still unknown caddisflies species exists (Bueno and Flint, 1978). Also more collecting needs to be done in the mountain forests at altitudes between 1000 to 3,500 m above sea level, where most of the Nearctic fauna of Mexican caddisflies can be found.

Morphological terminology for the family Philopotamidae follows Blahnik (1998); for Hydroptilidae, Marshall (1979); and for the families Lepidostomatidae and Hydropsychidae, Weaver (1988) and Flint, et al. (1987), respectively. Length was measured from the insertion of the forewing to the wing tip in all the species here described. Type material is deposited in the Colección Nacional de Insectos, Universidad Nacional Autónoma de México (CNIN, formerly IBUNAM).

Family Hydroptilidae

The Family Hydroptilidae is well represented in Mexico. However, the genus *Leucotrichia* is rarely attracted to light traps. At present, only five species have been recorded from Mexico by Mosely (1934), Ross (1944), and Flint (1967, 1970, Flint et al. 1999).

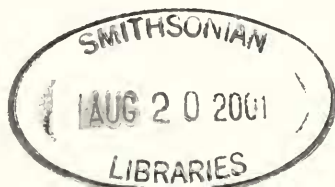
Leucotrichia extraordinaria Bueno, Santiago, Barba, NEW SPECIES

Fig. 1A-D

Because of the presence of three ocelli, spurs with formula 1-3-4, meso-scutellum with a transverse suture, metascutellum pentagonal, and phallus with the typical midventral complex, this species is a natural member of the *L. melleopicta* species group. However, *Leucotrichia extraordinaria*, new species, can be distinguished from the other species of the group by the elongate

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ventrolateral processes of the eighth segment in ventral view.

Adult ♂.- Length of forewing, 2 mm. Color in alcohol, dark brown.

Male genitalia: Seventh sternum with long, spatulate apicomeres process, which in lateral aspect appears with the apex extremely acute. Eighth sternum with elongate apicolateral processes with two or three black peg-like setae apically; with deep, U-shaped notch medially. Ninth segment slightly longer than broad in ventral aspect, with ventral surface more deeply divided than dorsal; posterolateral margin bordered by row of long setae; open ventrally; in lateral aspect, anterodorsal margin nearly straight; posteroventral angle slightly prolonged, with a long setae row. Subgenital plate narrow in ventral aspect, with basal tubular angles produced in short rounded lobes; U-shaped in lateral aspect with dorsal arm subequal to ventral arm, with small, ovoid basal opening in ventral aspect. Tenth tergite and lateral penis sheaths triangular. Inferior appendages fused basally; in ventral aspect, narrow with pair of preapical short, hooklike spines; apical portion with tips directed mesad; in lateral aspect, with dorsal margin straight. Phallus with apex bearing a lightly sclerotized apical tubule and small, membranous lateral processes, midlength complex with a long basal tubule, with two elongate, membranous loops.

Female: Unknown.

Type Material.- Holotype, ♂: MEXICO: TABASCO: Municipio de Huimanguillo, Arroyo las Flores, Villa de Guadalupe 2ª sección Los Chimalapas, km 5 Ruta Malpasito-Carlos A. Madrazo, 17° 22' 05" N; 93° 36' 25" W, 26-vi-1999, J. Bueno and R. Barba (CNIN). PARATYPES: 2 ♂ with the same data as the holotype (CNIN).

Etymology: The epithet of the species indicates uncommon, in allusion to the shape of the eighth sternum.

Byrsopteryx tabasquensis Bueno, Santiago, Barba, NEW SPECIES

Fig. 2A-D

This description establishes the first record of this genus from Mexico (Harris and Holzenthal, 1994). The bifurcate apical region of phallus in lateral and dorsal view distantly relates *Byrsopteryx tabasquensis*, new species, to *B. chaconi* Harris and Holzenthal from Costa Rica. However, *B. tabasquensis* can be separated from the above mentioned species by the very different size and shape of the subgenital plate in lateral view and by the rectangular shape of the inferior appendages in ventral view.

Adult ♂.- Length of forewing 2 mm. Color in alcohol, dark. Forewings centrally with thickened membrane, a distinct weak line separating the posterobasal area.

Male genitalia: Eighth tergum transversely rectangular; in lateral aspect with the anterior margin lobate; in ventral view, anterior margin produced in a midventral round lobe. Ninth segment in lateral view, with anterior margin produced; in ventral view with anterior margin tapering to a slightly emarginated and rounded apex; in dorsal view with a pair of sclerotized, parenthesis-like rods. Tenth tergum membranous, with a short basal dentiform process on the left side; in lateral view, a wide plate with a long basolateral seta, with two processes, the dorsalmost presents a sclerotized rodlike process, the ventral one appears wide at base, its ventral margin sinuous with series of black peglike setae at base, with apical portion produced into narrow neck with apex hooked ventrad. Subgenital plate in lateral and ventral view slender, terete, rodlike sclerite; in lateral view, produced preapically into narrow neck, the apical portion with tip hooked ventrad, with a long, membranous ventral rod with the apex obtuse. Inferior appendages, in lateral aspect,

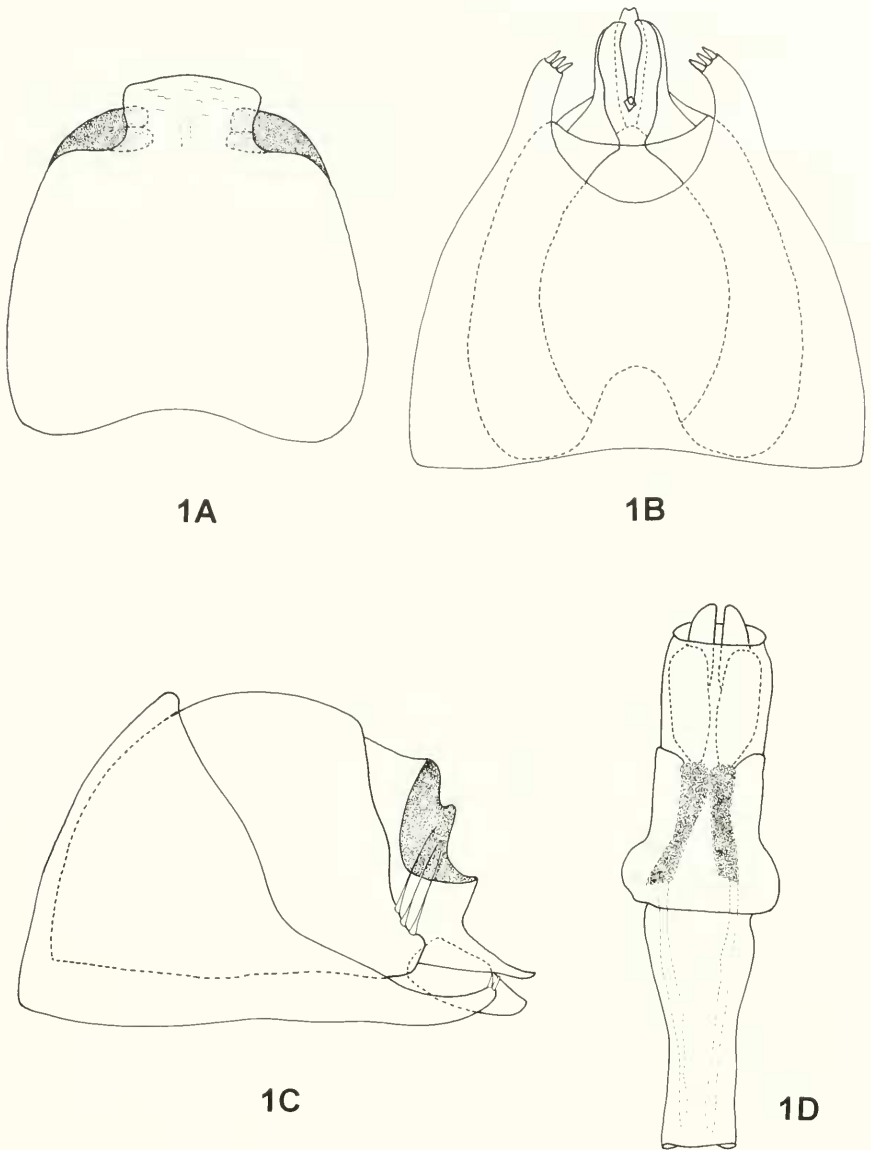


Fig. 1. *Leucotrichia extraordinaria* n. sp., male genitalia: A, Dorsal view. B, Ventral view. C, Lateral view. D, Phallus dorsal view.

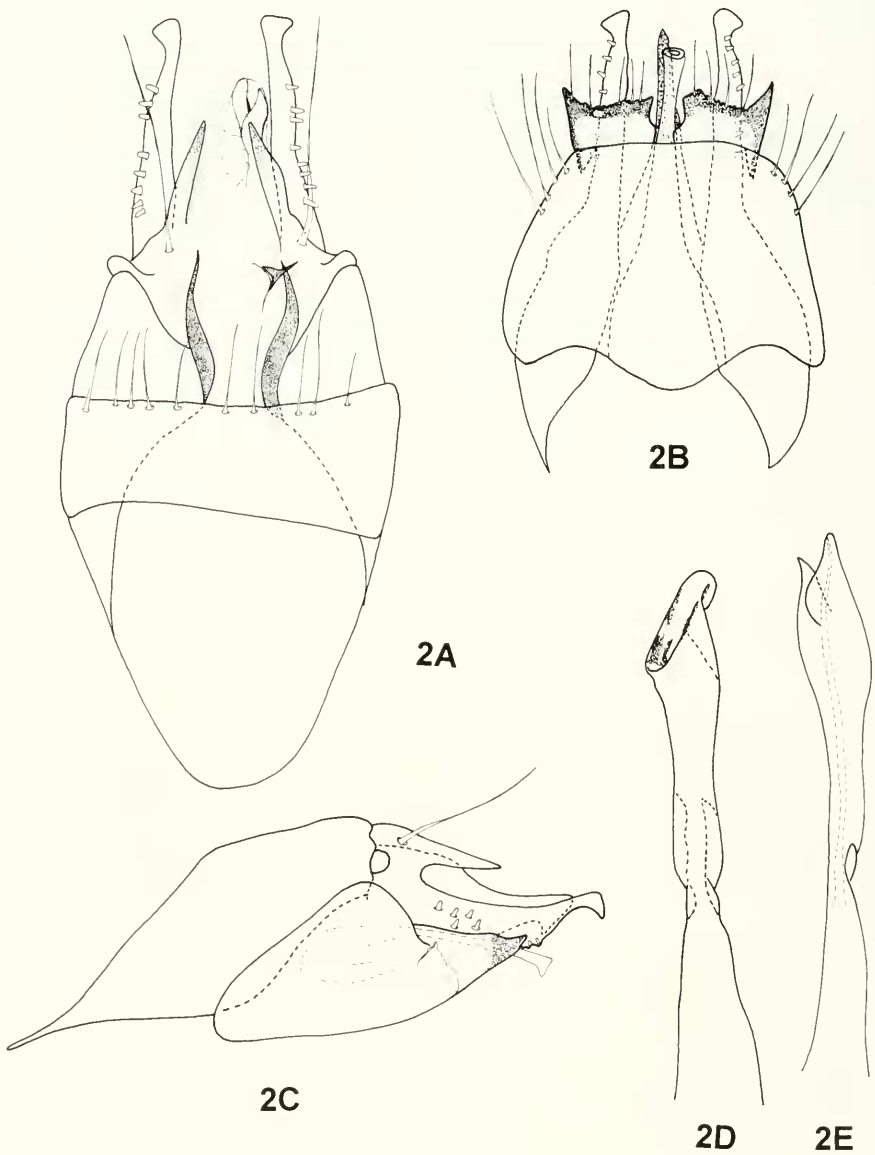


Fig. 2. *Byrsopteryx tabasquensis* n. sp., male genitalia: A, Dorsal view. B, Ventral view. C, Lateral view. D, Phallus dorsal view. E, Phallus in lateral view.

triangular with acute apex; in ventral view, rectangular with posterior margin darkened, dentate, with inner apex bifurcated into two short dentiform processes, external apices elongate horn-like processes slightly curved midventrally. Phallus with base conically flared; from midsection to apex with a long, membranous, tube; apex bifurcated in two membranous processes.

Female: Unknown.

Type Material.- Holotype, ♂; MÉXICO: TABASCO: Municipio de Huimanguillo, Arroyo Las Flores, Villa de Guadalupe 2^a Sección Los Chimalapas, km 5 Ruta Malpasito-Carlos A. Madrazo, 17° 22' 05" N; 93° 36' 25" W, 25-iii-1998, J. Bueno and R. Barba (CNIN). PARATYPES: with the same data as the holotype, 5♂ (CNIN). Same but 12-xi-98, 1♂ (CNIN).

Etymology: The species epithet, refers to Tabasco, the state where the species was collected.

Family Philopotamidae

This family is well represented in Mexico by a large number of species. Blahnik (1998), in his revision of the genus *Chimarra*, recorded 33 species for Mexico, we here describe an additional species from southeastern Mexico. The new species belongs to the *Chimarra primula* species group, on the basis of the ellipsoidal shape of the inferior appendages in lateral view and features of the tenth tergum.

Chimarra (Chimarra) chimalapa Bueno, Santiago, Barba, NEW SPECIES

Fig. 3A-E

This species is closely related to *Chimarra guatemalensis* Blahnik, differing only in minor aspects of the structure of the tenth tergum, the inferior appendages, and the phallic apparatus of the male. It differs from *C. guatemalensis* by the more expanded sensillae-bearing projections of the tenth tergum in dorsal aspect and by the presence on the phallus of two long endotheal spines, one longer by one third than the other.

Adult ♂.- Length of forewings 4.5 mm. Color in alcohol, nearly fuscous. Head flattened, postocular parietal sclerite elongate. Maxillary palp with third segment nearly twice as long as second, first segment very short, fourth segment slightly shorter than second, fifth segment slightly longer than third.

Male genitalia: Ninth abdominal segment with pair of distinct apodemes from anterolateral margin; anteroventral margin moderately and somewhat sinuously expanded from dorsal apodemes, with obtusely angular bend near ventral margin, as viewed laterally; posteroventral process short, broadly subtriangular, very wide basally, apex scarcely projecting, obtuse. Tenth tergum membranous mesally, sclerotized lateral lobes, each with two sensillae on elongated stalks, mounted on a rather broadly rounded, flattened, widely expanded, lateral process; apex of lateral lobe indistinctly sclerotized, large and triangular. Preanal appendages short, globose, slightly flattened. Inferior appendages ovate, convex, longer than in *guatemalensis*, with stout setae along the apicodorsal margin; each with short, broad, hooked, sclerotized, dorsomesal appendage; mesal surface with flattened, setose projection. Phallosome with apicoventral projection, two endotheal spines, with

the longest one third longer than the shorter, asymmetrically arranged on endotheca; apex of endotheca with minute, echinate spines. Phallotremal sclerite complex composed of rod and ring structure, rod of moderate length and ring with slight dorsal projection; apically with indistinct, troughlike, membranous structure.

Female: Unknown.

Type Material.- Holotype, ♂: MEXICO: TABASCO: Municipio de Huimanguillo, Arroyo las Flores, Villa de Guadalupe 2ª Sección Los Chimalapas, km 5 Ruta Malpasito-Carlos A. Madrazo, 17° 22' 05" N; 93° 36' 25" W, 16-iii-2000, J. Bueno, R. Barba and A. Rojas (CNIN). PARATYPES: with the same data as the holotype, 5♂ (CNIN).

Etymology: The species epithet refers to the name of the area in the state of Tabasco where the species was collected.

Remarks: The main differences encountered in the new species with respect to *C. guatemalensis* are the wider and triangular shape of the apical region of the lateral lobes of the tenth tergum in dorsal view, as well as the longer size of the endothecal spines.

Family Hydropsychidae

The genus *Smicridea* has been studied in Mexico and Central America by Flint (1974) and Flint and Denning (1989). Because this genus has a high diversity in the Neotropics, it is not surprising to find a new species in the tropical forest of Oaxaca and Guerrero.

Smicridea (S.) pochutla Bueno, Santiago, Barba, NEW SPECIES

Fig. 4A-E

This species appears to be closely related to *S. mirama* Flint & Denning (Flint & Denning, 1989, figs. 40-43) because of the long, slender, ventrolateral processes of the phallus. However, *Smicridea pochutla*, new species, is easily distinguished from *S. mirama* by the presence of two short spines on each side of the ventrolateral processes.

Adult ♂.- Length of forewing, 4 mm. Color in alcohol, dark brown; forewing denuded, membrane without the pale band on stigma.

Male genitalia: Ninth segment in lateral aspect slightly rectangular with anterior margin rounded; tapering to a dorsal margin. Tenth tergite narrow, apex slightly upturned in lateral aspect; in dorsal view expanded laterally, apex broadly rounded. Inferior appendages with long basal segment, expanded distally; apical segment elongate, apex acute. Phallus, in lateral aspect, slightly elongate basally, anterolateral corner rounded, open apically; ventrolateral processes long and slender, with the apex slightly upturned; in ventral aspect with two short spines basally on each exterior side of the ventrolateral processes.

Female: Unknown.

Type Material.- Holotype, ♂: MÉXICO: OAXACA: Pochutla, Finca Progreso, 2-vi-1987, E. Barrera (CNIN). Paratype: GUERRERO: Ruta 130, 80 km N W of Zihuatanejo, 8-v-1988, el. 1200 m, J. Bueno 1 ♂ (CNIN).

Etymology: The species epithet refers to Pochutla, the region in the state of Oaxaca where the holotype was collected.

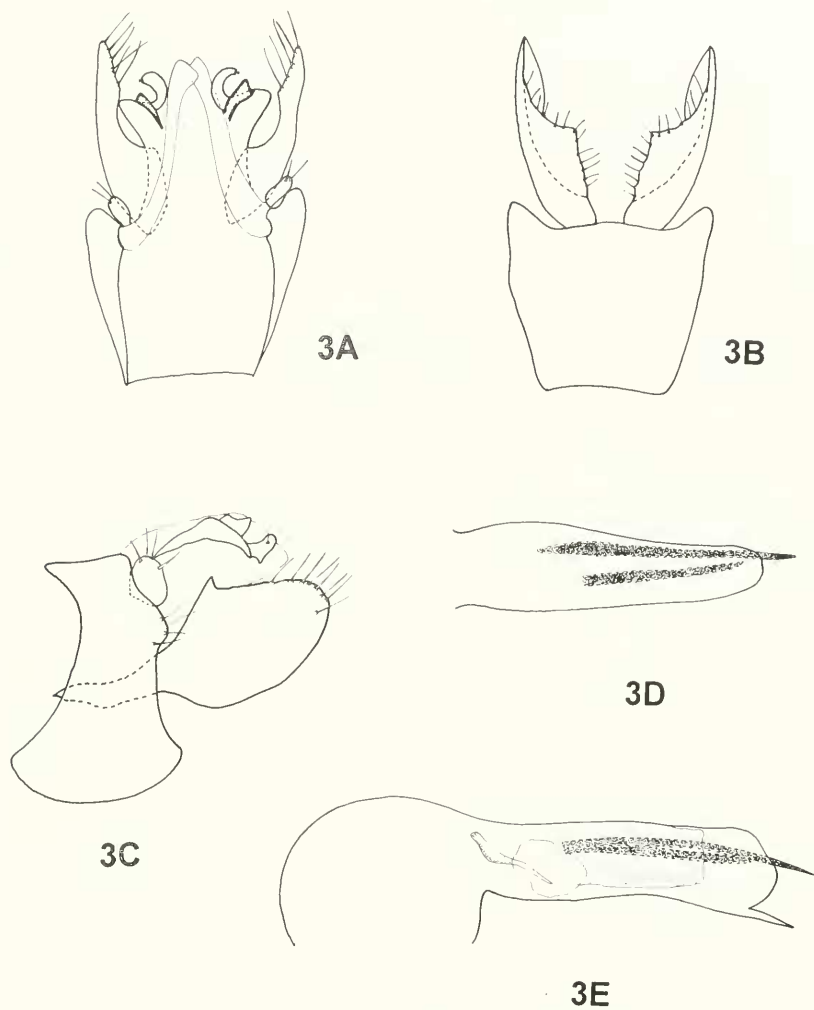


Fig. 3. *Chimarra C. chimalapa* n. sp., male genitalia: A, Dorsal view. B, Ventral view. C, Lateral view. D, Apical section of phallus in dorsal view. E, Phallus in lateral view.

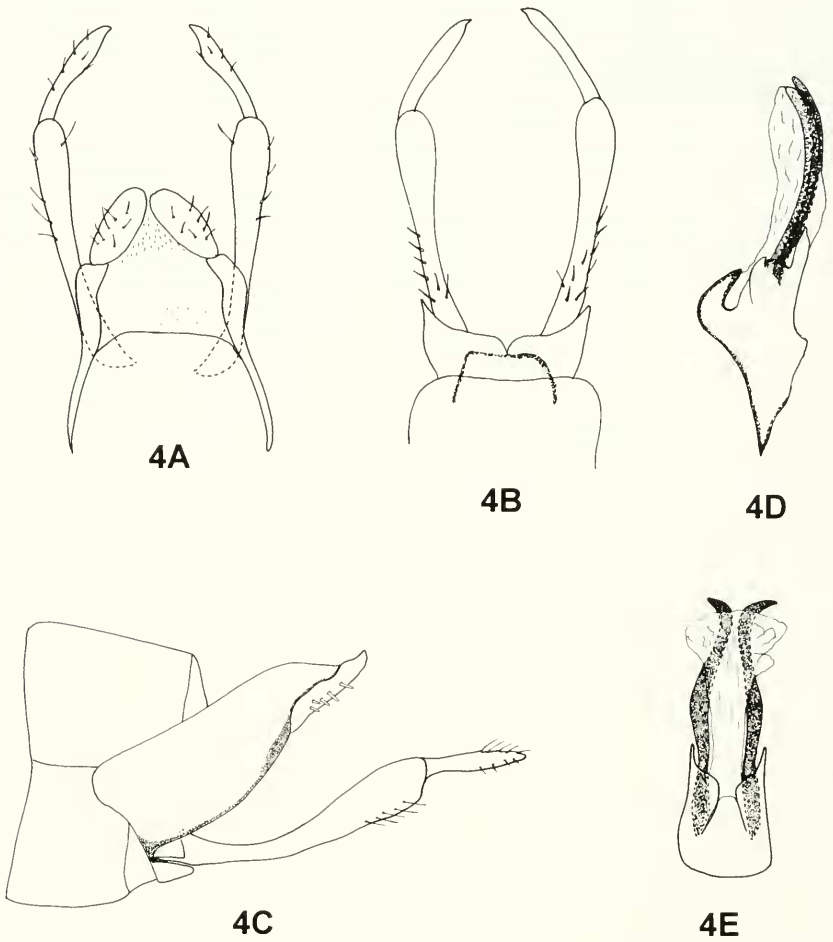


Fig. 4. *Smicridea S. pochutla* n. sp., male genitalia: A, Dorsal view. B, Ventral view. C, Lateral view. D, Phallus in lateral view. E, Phallus dorsal view.

Leptonema pinotepa Bueno, Santiago, Barba, NEW SPECIES

Fig. 5A-D

Leptonema pinotepa, new species, appears closely related to *L. michoacanense* Flint, McAlpine, Ross and *L. plicatum* Mosely by the general structure of the processes on the apical portion of the phallus. However, the new species can be separated from these two species because the phallus in lateral view has a long, curved, bifurcate process, as well as by the wide and triangular apicolateral processes "b" of the phallus.

Adult ♂.- Length of forewing, 16 mm. Color, light brown; forewing almost transparent over thyrudial cell. Malar space narrow, about 1/3 height of eye. Parafacial and postocular areas almost as wide as malar; postocular area with a row of 5 stout setae. Maxillary palpus with fifth segment as long as 2/3 the length of basal four segments together. Processes of fifth sternum large, ovoid.

Male genitalia: Tenth tergum with warts a, and b, on short stalks; lateral lobe rounded apically, ventral margin slightly sinuate. Inferior appendages with apical segment short, terete; basal segment 5 times as long as apical, base unmodified. Phallus in lateral view, with phallobase elongate, slightly angled; apical section, with long, curved, bifurcate processes, which are sclerotized; in dorsal view the processes appear dark and parallel to apical section; processes b wide and triangular; phallotremal sclerites f dark and rhomboidal.

Female: Unknown

Type Material.- Holotype, ♂; MEXICO: OAXACA: Metates, Sierra de Juárez, el. 1600 m, 16-ix-1982, A. Ibarra (CNIN). Paratype: OAXACA: Pinotepa Nacional, 20-vi-1982, M. García 1 ♂ (CNIN).

Etymology: The species epithet refers to the Pinotepa Nacional region in the state of Oaxaca where the holotype was collected.

Family Lepidostomatidae

This family is represented in the streams of the highlands of Mexico by the genus *Lepidostoma*. This genus has been studied by Flint & Bueno (1977), Bueno and Padilla (1981), Bueno and Contreras (1986), Weaver (1988), and Holzenthal and Strand (1992). In Mexico, the genus *Lepidostoma* is represented by 15 species.

Lepidostoma (Nosopus) catarina Bueno, Santiago, Barba, NEW SPECIES

Fig. 6A-D

Lepidostoma catarina, new species, is a member of the *Mexicanum* Group. It is closely related to *Lepidostoma aztecum* Flint & Bueno, as evidenced by the presence of two processes on the tenth tergum in lateral view and a basodorsal semierect process on the inferior appendages in lateral view. However, the new species can be distinguished from *L. aztecum* because the tenth tergum in dorsal aspect appears with a small notch middorsally with two long lateral processes, and the inferior appendages, in dorsal view, possess a gob-

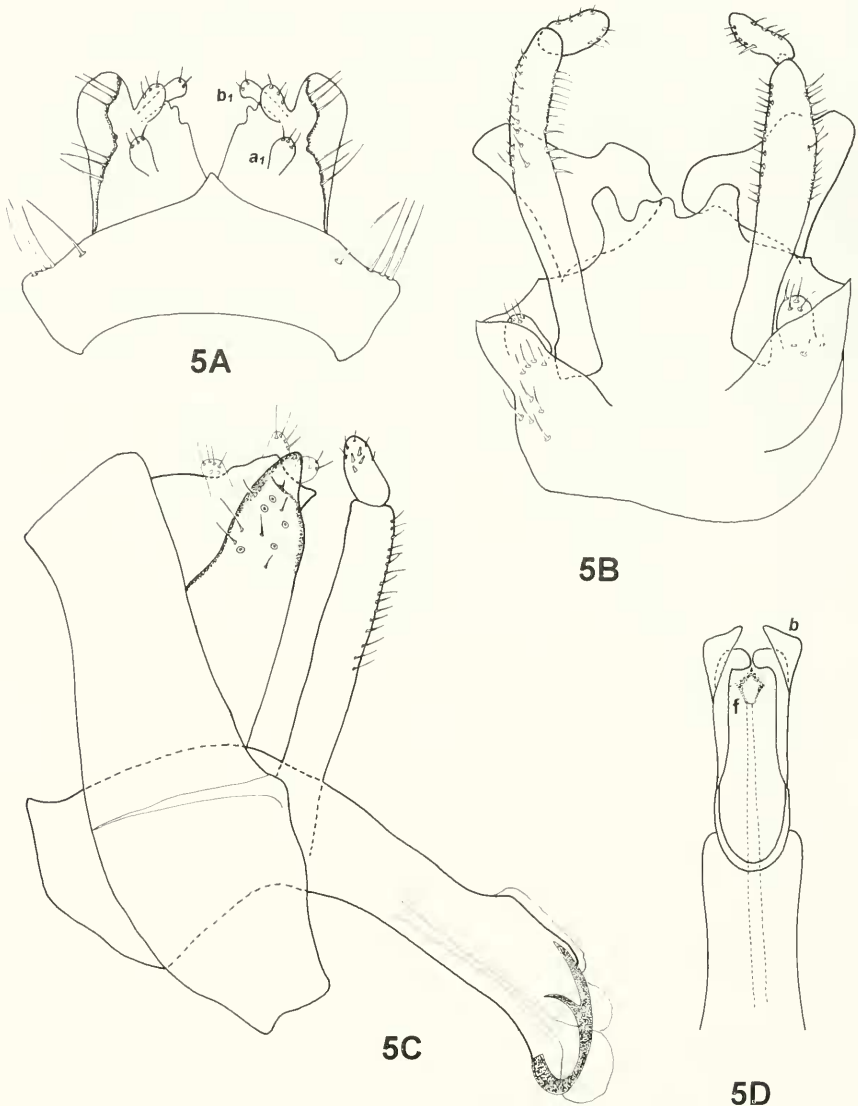


Fig. 5. *Leptonema pinotepa* n. sp., male genitalia: A, Dorsal view, tenth tergum with warts a_1 and b_1 on short stalks. B, Ventral view. C, Lateral view. D, Apical section of phallus in dorsal view, with phallic processes b and phallotremal sclerites

let-shaped apex with a mesal flap-like bifurcate lobe.

Adult ♂. - Length of forewing, 9 mm. Color in alcohol, brown. Antenna stramineous. Maxillary palpus 1-segmented, spatulate. Antenna with basal segment terete, as long as head, unmodified; legs and wings without modification.

Male genitalia: Tenth tergum in lateral view divided into two processes, the dorsalmost appears strong erect spine-like, the ventralmost process elongate ending in a bifurcate apex; in dorsal view, with small notch middorsally, with two long, dorsolateral processes, the ventralmost processes elongate, wider, ending in dentate apex. Inferior appendages in lateral view, with basodorsal process, extending slightly beyond midlength of inferior appendages; ventral arm of process appressed to inferior appendages tapering to apex; in dorsal view, with small tooth-like process, apex with blunt lateral lobe; in dorsal aspect with bifurcate lateral lobe; a strong, digitiform central lobe, and a mesal lobe with apex

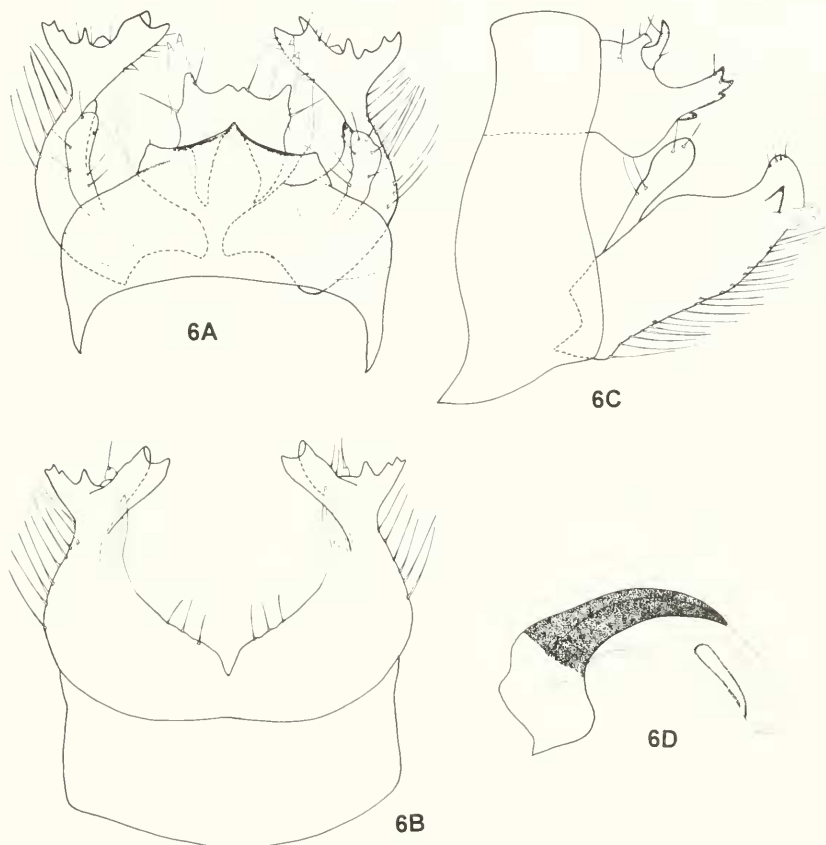


Fig. 6. *Lepidostoma (Nosopus) catarina* n. sp., male genitalia: A, Dorsal view. B, Ventral view. C, Lateral view. D, Phallus lateral view.

bifurcated and flap-like; with sinuous basal connection to base of phallus. Phallus, in lateral view, with enlarged base, central curved tubular portion, and pair of short, dorso-lateral, spine-like sclerites.

Female: Unknown.

Type Material – Holotype: ♂; MEXICO: OAXACA: Sta Catarina La Chatao, 17° 15' 58" N, 96° 28' 15" W, el. 2160 m, 5-6-xii-1999, A. Rojas (CNIN). Paratypes, with the same data as the holotype, 6♂ (CNIN); Puerto Angel, km 156, Ruta 175, el. 2100 m, 21 xii 1982, J. Bueno, 1♂ (CNIN); GUERRERO: Mpio. de Chilpancingo, Parque Ecológico Estatal Omiltemi, Zona La Perra, 23-x-1998, Martínez and Casasola, 1♂ (CNIN)

Etymology: The specific epithet refers to Santa Catarina, Oaxaca, where the holotype was collected.

Lepidostoma (Nosopus) ixtlahuaca Bueno, Santiago, Barba, NEW SPECIES

Fig. 7A-D

Lepidostoma (Nosopus) ixtlahuaca, new species, is another member of the *Mexicanum* Group due to the cylindrical shape of the scape and the modified maxillary palps with dark scales. It seems related to *L. oaxacensis* Bueno and Contreras, because of the bifid apex of the inferior appendages in lateral view. However, the new species is easily distinguished by the more elongate basodorsal process of the inferior appendages in lateral view, as well as by the terete lobes of the tenth tergum in dorsal view.

Adult ♂. – Length of forewing, 9 mm. Color in alcohol, pale brown, antennae stramineous; forewings with a group of broad scale-like setae on the radial veins. Maxillary palpus 1-segmented, slightly cylindrical, both palpi contiguous, mesal face concave and filled with broad scale-like setae. Antenna with basal segment terete, as long as head, unmodified. Legs without modification.

Male genitalia: Tenth tergum in lateral aspect divided in two plates; dorsalmost with group of apicodorsal, spinelike processes produced ventrally; ventralmost with pair of strong spinelike processes; in dorsal view, with central area membranous with short processes with setae at apex, and group of black peglike setae at base; with pair of lateral, terete processes, and two ventrolateral plates, the left one with pair of strong spinelike processes. Inferior appendages, in lateral view, with long, curved, basodorsal process, extending slightly beyond midlength of the inferior appendages, ventral arm of process wider preapically with acute bifurcate apex; apex with two flat lobes situated apicodorsally; in dorsal view, apex with pair of compressed broad rounded lobes with darkened, short, spinelike process; at midlength with long, thin, spinelike process; in ventral view symmetrical, apical portion with two short, lateral processes. Phallus in lateral view with enlarged membranous tube ventrally situated, with a pair of dorsolateral swordlike processes, strongly darkened at apex.

Female: Unknown.

Type Material. – Holotype, ♂; MEXICO: HIDALGO: Ixtlahuaco, el. 1320 m, 27 xi 1998, H. Brailovsky and E. Barrera (CNIN). Paratype, HIDALGO: Ixtlahuaco, Rta. 105, Hotel Campestre Conchita, 20° 53'45" N 98° 41' 47" W, 1420 m, 2-v-2000, J. Bueno and R. Barba, 1♂ (CNIN).

Etymology: The species epithet is the feminine termination for the place where the holotype was collected, Ixtlahuaco.

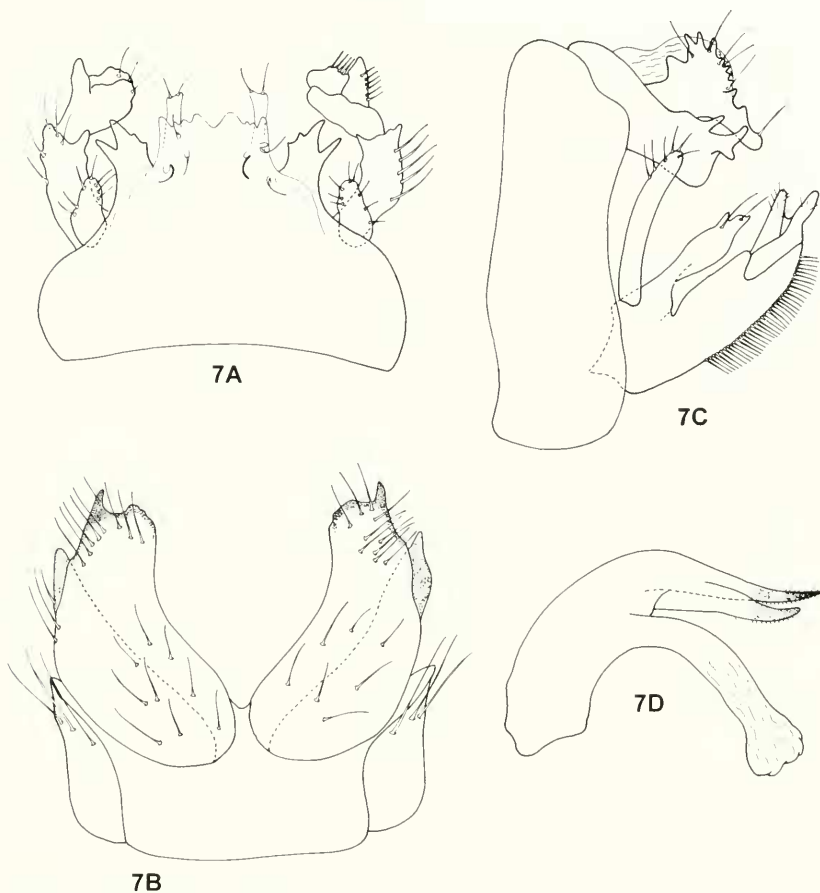


Fig. 7. *Lepidostoma (Nosopus) ixtlahuaca* n. sp., male genitalia: A, Dorsal view. B, Ventral view. C, Lateral view. D, Phallus lateral view.

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